
79 High Street, Wargrave, Reading RG10 8BU

Planning Compliance Report
Report 28162.PCR.01

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Revision History		
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List of Attachments

20162.TH1	Environmental Noise Time History
20162.Daytime L90.TH1	Statistical analysis for representative daytime L_{A90}
20162.Night-time L90.TH1	Statistical analysis for representative night-time L_{A90}
Appendix A	Glossary of Acoustics Terminology
Appendix B	Acoustic Calculations
Appendix C	Anti-Vibration Mounting Specification Reference Document

1.0 INTRODUCTION

KP Acoustics Ltd has been commissioned to undertake a noise impact assessment of a proposed plant unit installation serving the building at 79 High St, Wargrave, Reading RG10 8BU.

An environmental noise survey has been undertaken on site and the background noise levels measured have been used to determine noise emission criterion for the proposed plant, in agreement with the planning requirements of Wokingham Borough Council.

This report presents the overall methodology and results from the environmental survey, followed by calculations to demonstrate the feasibility of the plant unit installation to satisfy the emissions criterion at the closest noise-sensitive receiver. Mitigation measures will be outlined as appropriate.

2.0 SITE SURVEYS

2.1 Site Description

As shown in Figure 2.1, the site is bounded by 73 High Street to the north, Wargrave High Street to the west, School Lane to the south, and a public Car Park to the east.

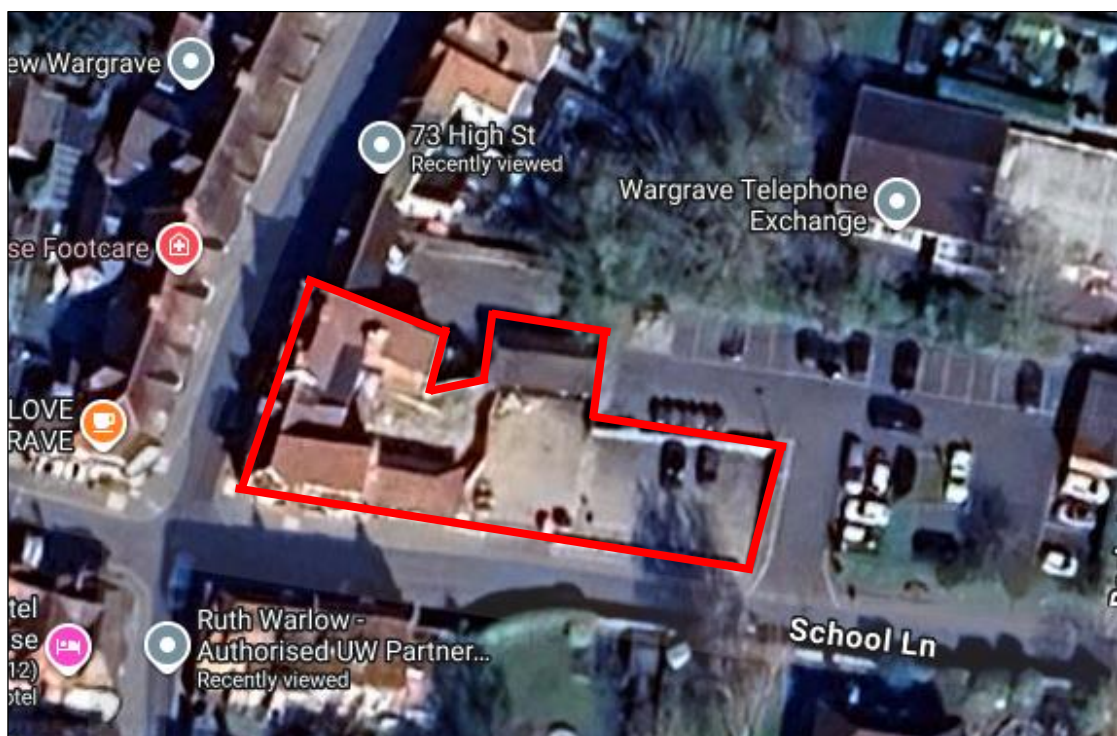


Figure 2.1 Site location plan (Image Source: Google Maps)

Initial inspection of the site revealed that the background noise profile at the monitoring location was dominated by road traffic noise, except for between 08:00-16:00 where

construction noise dominated. It is noted that noise levels between this period will not be considered in the context of the assessment as they are not deemed representative of the typical environment.

2.2 Environmental Noise Survey Procedure

Continuous automated monitoring was undertaken for the duration of the noise survey between 13:40 on 08/01/2025 and 12:55 on 10/12/2025.

The environmental noise measurement position, proposed plant installation locations, and the closest noise sensitive receiver relative to the plant installations are described within Table 2.1 and shown within Figure 2.2.

Icon	Descriptor	Location Description
	Noise Measurement Position 1	The microphone was installed on a pole to the rear of the public house, approximately 2m above ground. The microphone was positioned within free-field conditions at least 3.5 metres from the nearest surface.
	Nearest noise sensitive receptor (NSR) 1	First Floor hotel window.
	Proposed plant installation location	Proposed plant installations are outlined in Section 5.1.

Table 2.1 Measurement positions and descriptions



Figure 2.2 Site measurement positions (Image Source: Google Maps)

The choice of the position was based both on accessibility and on collecting representative noise data in relation to the nearest noise sensitive receiver and the proposed plant installations.

Weather conditions were generally dry with light winds and therefore suitable for the measurement of environmental noise. The measurement procedure complied with ISO 1996-2:2017 Acoustics '*Description, measurement and assessment of environmental noise - Part 2: Determination of environmental noise levels*'.

2.3 Equipment

The equipment calibration was verified before and after use and no abnormalities were observed. The equipment used is described within Table 2.2.

Measurement instrumentation		Serial no.	Calibration Date	Cert no.
Noise Kit 40	NTI Audio XL2 Class 1 Sound Level Meter	A2A-24279-E1	27/01/2024	UK-24-007
	Free-field microphone NTI Acoustics MC230A	A26879		
	Preamplifier NTI Acoustics MA220	14180		
	NTI Audio External Weatherproof Shroud	-	-	-
B&K Type 4231 Class 1 Calibrator		2147411	10/09/2025	UCRT25/2295

Table 2.2 Measurement instrumentation

3.0 RESULTS

The $L_{Aeq,5min}$, $L_{Amax,5min}$ and $L_{A90,5min}$ acoustic parameters were measured throughout the duration of the survey. Measured levels are shown as a time history in Figure 28162.TH1.

Representative background noise levels for daytime and night-time are shown in Table 3.1; these have been derived from the measured $L_{A90,5min}$ levels based on the guidance of BS4142:2014 Section 8.1.4. Analyses of the measured $L_{A90,5min}$ levels are shown in 28162.Daytime L90.TH1 and 28162.Night-time L90.TH1 attached.

Time Period	Representative Free-field Background Noise Level L_{A90}
Daytime (07:00-23:00)	46 dB(A)
Night-time (23:00-07:00)	31 dB(A)

Table 3.1 Representative background noise levels (free field)

4.0 NOISE ASSESSMENT GUIDANCE

4.1 Local Authority Guidance

Wokingham Borough Council does not publish a standalone SPD for fixed plant noise but applies policy CC06 (Noise Pollution) from its Local Plan to protect the amenity of nearby noise-sensitive receptors. In line with this, recent 2025 planning approvals require compliance with the principles of BS 4142:2014+A1:2019.

Planning conditions applied to extract and mechanical plant typically state that:

“The rating level of noise emitted from all fixed plant and equipment shall not exceed a level of 5 dBA below the existing background noise level (L_{A90}) at 1 metre from the façade of the

nearest noise-sensitive receptor. Where the plant noise exhibits tonal characteristics, the limit shall be reduced to 10 dBA below background."

4.2 Noise Emissions Criterion

As the proposed plant could be used at any time of the day or night, the criterion has been set as shown in Table 4.1 in order to comply with the above requirements.

Time Period	Plant Noise Emissions Criterion at Nearest Residential Receiver
Night-time	≤ 26 dB(A)

Table 4.1 Proposed noise emissions criterion

5.0 NOISE IMPACT ASSESSMENT

5.1 Proposed Plant Installations

It is understood that the proposed plant installation is comprised of the following units:

- 1 No. Vitocal 150-A 150-A16 SP 230 ASHP unit;
- 1 No. Panasonic CU-2Z50TBE AC unit.

The proposed installation location for the proposed plant units will be to the west of the bin store, as shown in Figure 2.2 above and Figure 5.1 below.

The sound power levels, L_w and sound pressure levels, L_p as provided by the manufacturer for the units are shown in Table 5.1.

Unit	Descriptor	Overall (dBA)
Vitocal 150-A 150-A16 SP 230 ASHP unit	L_w , dB	56
Panasonic CU-2Z50TBE AC unit	L_p @1m, dB	53

Table 5.1 Plant units noise emission levels as provided by the manufacturer

It is noted that only the cumulative sound power, L_p and sound pressure levels, L_p were supplied by the manufacturer for each unit and octave-band sound data was not available. Spectral data has therefore been extrapolated from similar units for the calculations which can be found in Appendix B.

The proposed plant layout is presented in the figure below:

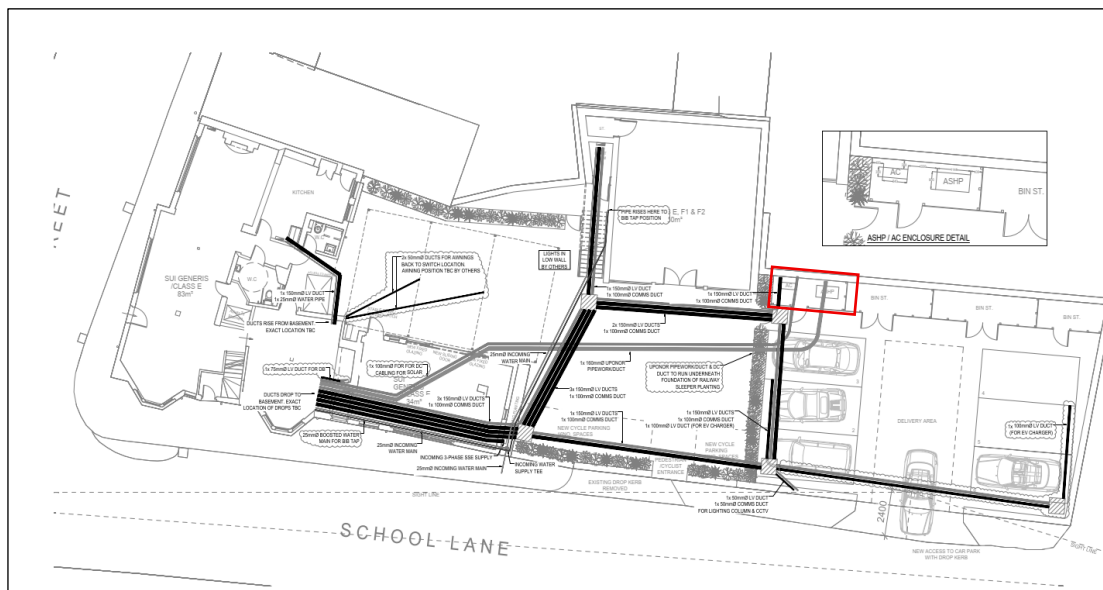


Figure 5.1 Proposed plant layout

The closest noise sensitive receiver to the proposed installation location has been identified as being a first floor hotel room window within the site, located approximately 20 metres from the proposed plant installation location, as shown in Figure 2.2.

It should be noted the proposed plant unit would be out of line of sight of the receiving windows due to screening from the building envelope.

5.2 Calculations

Taking all acoustic corrections into consideration, the noise level contribution expected at the closest noise sensitive window from the proposed plant would be as shown in Table 5.2. Detailed calculations are shown in Appendix B.

Receiver	Criterion	Noise Level at 1m From the Worst-case Noise Sensitive Window
First floor hotel window	26 dB(A)	25dB(A)

Table 5.2 Predicted noise level and criterion at nearest noise sensitive location

As shown in Appendix B and Table 5.2, transmission of noise to the nearest sensitive windows from the proposed plant unit installation satisfies the emissions criterion of Wokingham Borough Council.

6.0 CONCLUSION

An environmental noise survey has been undertaken at 79 High St, Wargrave, Reading RG10 8BU by KP Acoustics Ltd. The results of the survey have enabled criterion to be set for noise emissions.

Using manufacturer noise data, noise levels are predicted at the nearby noise sensitive receivers for compliance with current requirements.

Calculations show that noise emissions from plant would meet the requirements of Wokingham Borough Council.

79 HIGH STREET, WARGRAVE, READING - Position 1
Environmental Time History
08/12/2025 to 10/12/2025

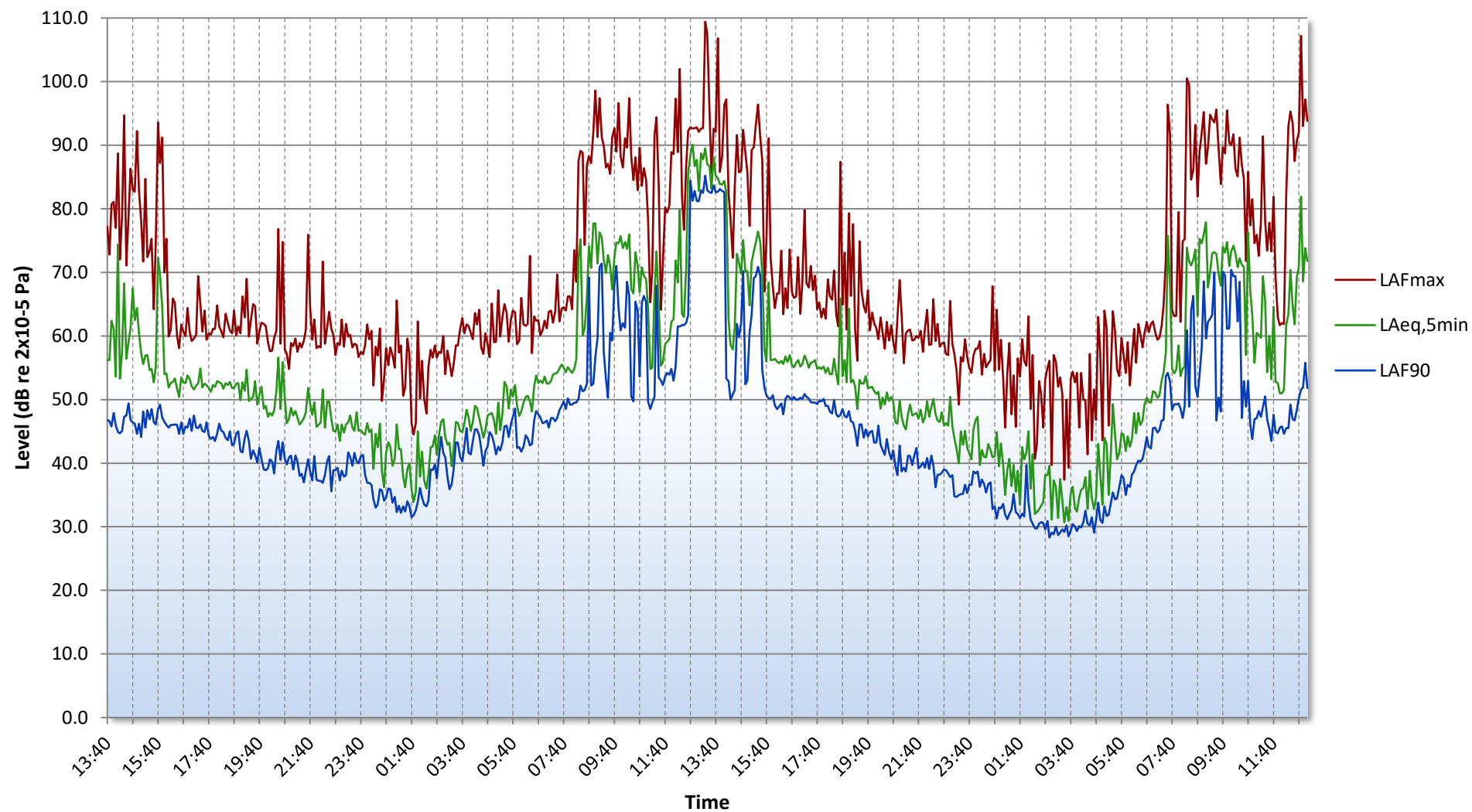


Figure 28162.TH1

79 HIGH STREET, WARGRAVE, READING - Position 1
Representative Daytime Background Noise Level
08/12/2025 to 10/12/2025

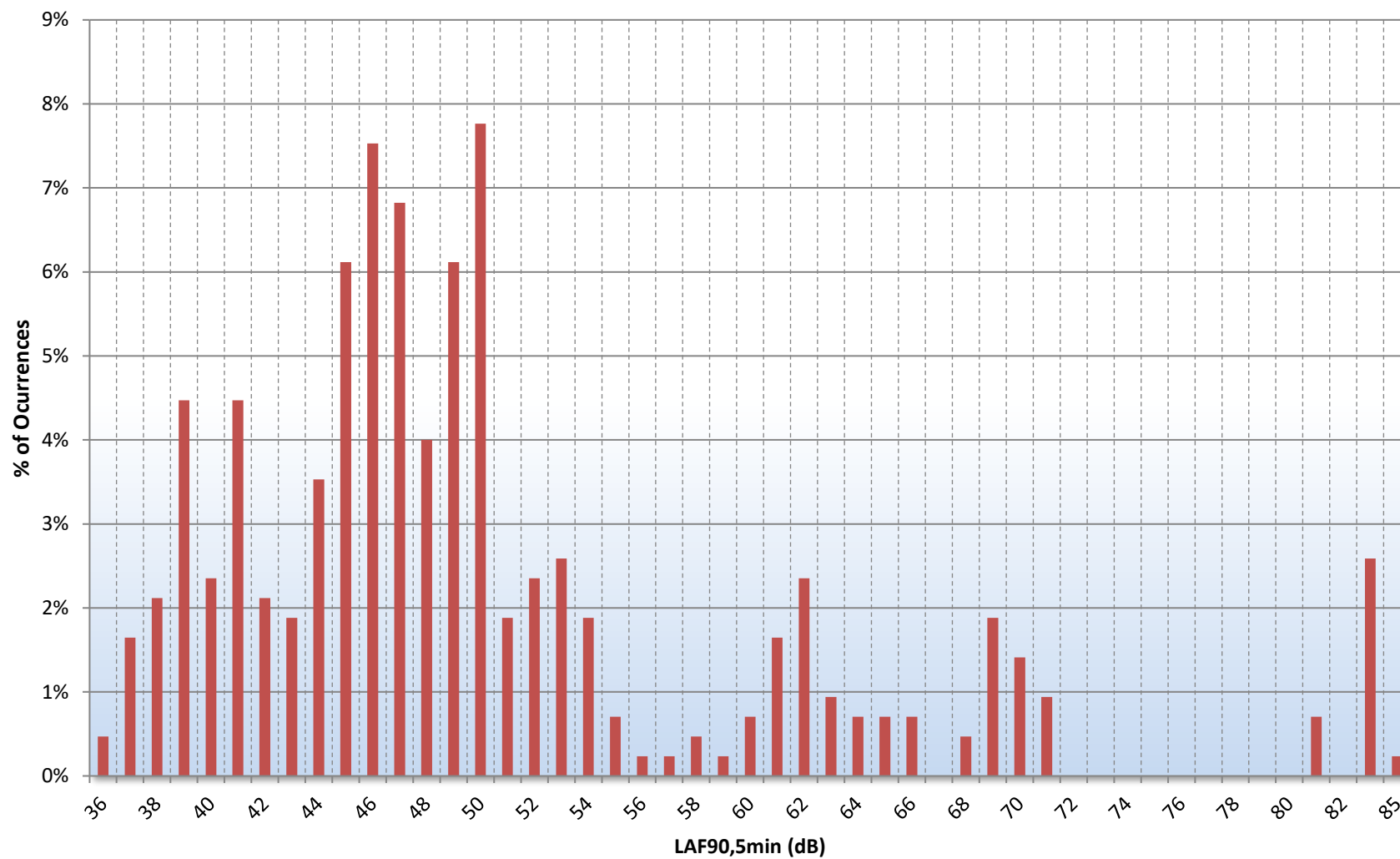


Figure 28162.Daytime L90.TH1

79 HIGH STREET, WARGRAVE, READING - Position 1
Representative Night-time Background Noise Level
08/12/2025 to 10/12/2025

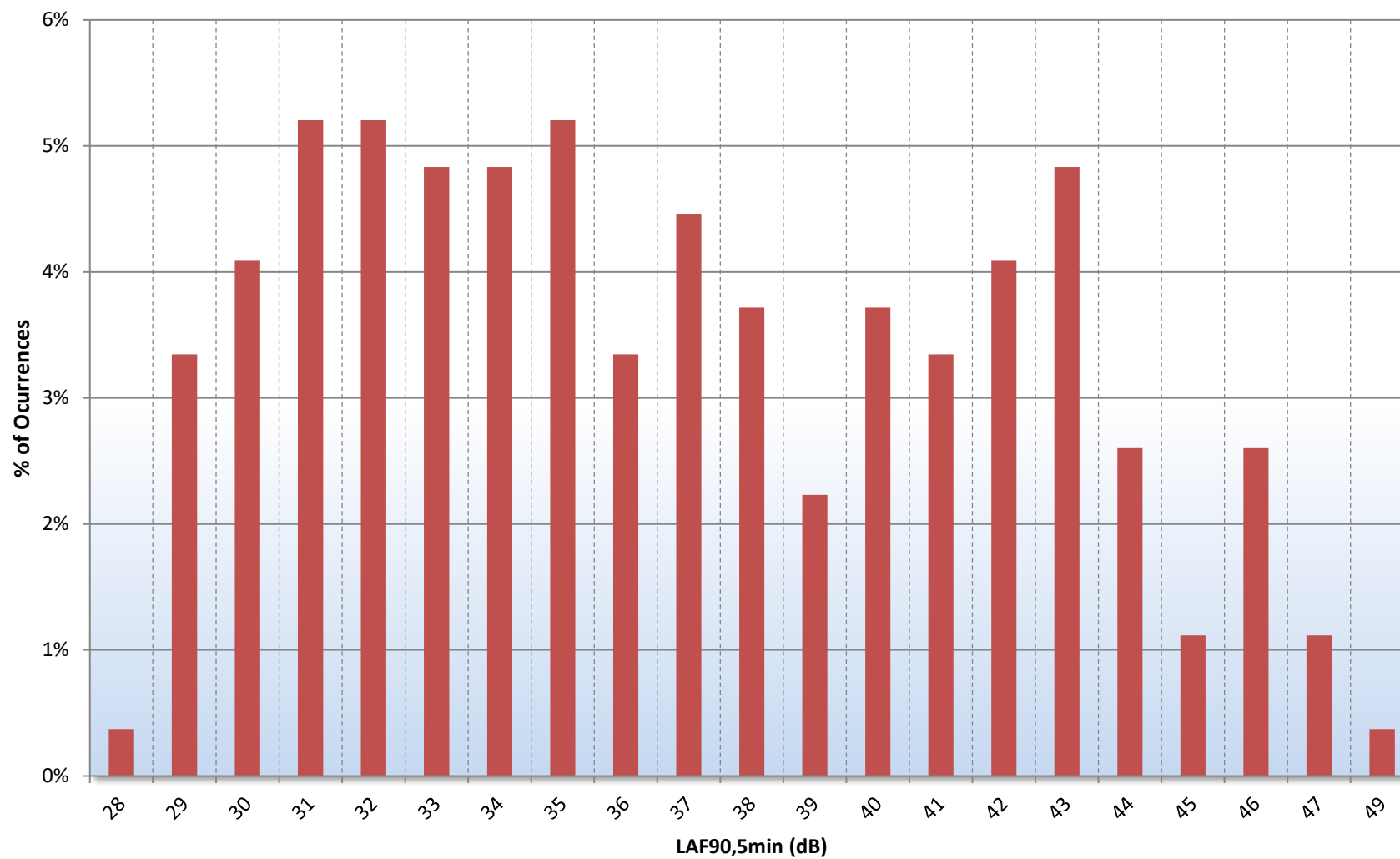


Figure 28162.Night-time L90.TH1

GENERAL ACOUSTIC TERMINOLOGY

Decibel scale - dB

In practice, when sound intensity or sound pressure is measured, a logarithmic scale is used in which the unit is the 'decibel', dB. This is derived from the human auditory system, where the dynamic range of human hearing is so large, in the order of 10^{13} units, that only a logarithmic scale is the sensible solution for displaying such a range.

Decibel scale, 'A' weighted - dB(A)

The human ear is less sensitive at frequency extremes, below 125Hz and above 16Khz. A sound level meter models the ears variable sensitivity to sound at different frequencies. This is achieved by building a filter into the Sound Level Meter with a similar frequency response to that of the ear, an A-weighted filter where the unit is dB(A).

L_{eq}

The sound from noise sources often fluctuates widely during a given period of time. An average value can be measured, the equivalent sound pressure level L_{eq} . The L_{eq} is the equivalent sound level which would deliver the same sound energy as the actual fluctuating sound measured in the same time period.

L_{10}

This is the level exceeded for no more than 10% of the time. This parameter is often used as a "not to exceed" criterion for noise.

L_{90}

This is the level exceeded for no more than 90% of the time. This parameter is often used as a descriptor of "background noise" for environmental impact studies.

L_{max}

This is the maximum sound pressure level that has been measured over a period.

Octave Bands

In order to completely determine the composition of a sound it is necessary to determine the sound level at each frequency individually. Usually, values are stated in octave bands. The audible frequency region is divided into 11 such octave bands whose centre frequencies are defined in accordance with international standards. These centre frequencies are: 16, 31.5, 63, 125, 250, 500, 1000, 2000, 4000, 8000 and 16000 Hertz.

Environmental noise terms are defined in BS7445, *Description and Measurement of Environmental Noise*.

APPLIED ACOUSTIC TERMINOLOGY

Addition of noise from several sources

Noise from different sound sources combines to produce a sound level higher than that from any individual source. Two equally intense sound sources operating together produce a sound level which is 3dB higher than a single source and 4 sources produce a 6dB higher sound level.

Attenuation by distance

Sound which propagates from a point source in free air attenuates by 6dB for each doubling of distance from the noise source. Sound energy from line sources (e.g. stream of cars) drops off by 3dB for each doubling of distance.

Subjective impression of noise

Hearing perception is highly individualised. Sensitivity to noise also depends on frequency content, time of occurrence, duration of sound and psychological factors such as emotion and expectations. The following table is a guide to explain increases or decreases in sound levels for many scenarios.

Change in sound level (dB)	Change in perceived loudness
1	Imperceptible
3	Just barely perceptible
6	Clearly noticeable
10	About twice as loud

Transmission path(s)

The transmission path is the path the sound takes from the source to the receiver. Where multiple paths exist in parallel, the reduction in each path should be calculated and summed at the receiving point. Outdoor barriers can block transmission paths, for example traffic noise. The effectiveness of barriers is dependent on factors such as its distance from the noise source and the receiver, its height and construction.

Ground-borne vibration

In addition to airborne noise levels caused by transportation, construction, and industrial sources there is also the generation of ground-borne vibration to consider. This can lead to structure-borne noise, perceptible vibration, or in rare cases, building damage.

Sound insulation - Absorption within porous materials

Upon encountering a porous material, sound energy is absorbed. Porous materials which are intended to absorb sound are known as absorbents, and usually absorb 50 to 90% of the energy and are frequency dependent. Some are designed to absorb low frequencies, some for high frequencies and more exotic designs being able to absorb very wide ranges of frequencies. The energy is converted into both mechanical movement and heat within the material; both the stiffness and mass of panels affect the sound insulation performance.

APPENDIX B

79 HIGH STREET, WARGRAVE, READING

PLANT NOISE EMISSIONS CALCULATIONS

Source: 1no. ASHP and 1no. A/C unit Receiver: First Floor hotel window	Frequency, Hz								dB(A)
	63	125	250	500	1k	2k	4k	8k	
Vitocal 150-A 150-A16 SP 230 Sound Power Level, (Extrapolated), dB	66	61	57	54	51	46	40	35	56
Conversion to sound pressure level @1m, dB	-11	-11	-11	-11	-11	-11	-11	-11	
Panasonic CU-2250TBE, Sound pressure Level @1m (Extrapolated) dB	62	57	53	50	47	42	36	31	
Total sound pressure level of both units @1m,dB	63	58	54	51	48	43	37	32	53
Correction due to surface reflections (1), dB	3	3	3	3	3	3	3	3	
Minimum attenuation due to screening from building envelope, dB	-5	-5	-5	-5	-5	-5	-5	-5	
Minimum attenuation provided by distance (20m), dB	-26	-26	-26	-26	-26	-26	-26	-26	
Total Rating Noise Level of all Plant Unit Installations at Receiver	35	30	26	23	20	15	9	4	25

Design Criterion	26
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ANTI-VIBRATION MOUNTING REFERENCE DOCUMENT

1.0 GENERAL

- 1.1.1 All mountings must provide suitable static deflection when under the equipment weight. Mounting selection should allow for any eccentric load distribution or torque reaction so that the design deflection is achieved on all mountings under operating conditions.
- 1.1.2 A positioning or restraining device should be provided where required, to prevent the equipment position changing if its load changes (e.g. during maintenance). The device shall consist of a stud passing through an oversize hole with a nut and locknut providing restraint, with a fibre or neoprene washer fitted between nut and restraining member leaving a clearance of at least 3mm.
- 1.1.3 It is the supplier's responsibility to ensure that all mountings offered are suitable for the loads, operating and environmental conditions which will prevail. Particular attention should be paid to mountings which will be exposed to atmospheric conditions to prevent corrosion.
- 1.1.4 All mountings shall be colour coded, or otherwise marked, to indicate their load capacity, to facilitate identification during installation.
- 1.1.5 Where use of resilient supports allows omission of pipe flexible connections for vibration/noise isolation, it shall be the Mechanical Services Consultant's or Contractor's responsibility to decide whether such devices are required to compensate for misalignment or thermal strain.

2.0 MOUNTINGS

2.1 Caged Spring Type

- 2.1.1 Each mounting shall consist of cast or fabricated telescopic top and bottom housings enclosing one or more helical steel springs as the principal isolation elements and shall incorporate a built-in levelling device. The housing should be designed to permit visual inspection of the springs after installation, i.e. the spring must not be totally enclosed.
- 2.1.2 The springs shall have an outside diameter of not less than 75% of the operating height and be selected to have at least 50% overload capacity before becoming coil-bound.
- 2.1.3 The bottom plate of each mounting shall have bonded to it a rubber/neoprene pad designed to attenuate any high frequency energy transmitted by the springs.
- 2.1.4 Mountings incorporating snubbers or restraining devices shall be designed so that the snubbing, damping, or restraining mechanism is capable of being adjusted to have no significant effect during the normal running of the isolated machine.
- 2.1.5 All nuts, bolts or other elements used for adjustment of a mounting shall incorporate locking mechanisms to prevent the isolator going out of adjustment due to vibration or accidental or unauthorised tampering.

2.2 Open Spring Type

- 2.2.1 Each mounting shall consist of one or more helical steel springs as the principal isolation elements and shall incorporate a built-in levelling device.
- 2.2.2 The springs shall be fixed or otherwise securely located to cast or fabricated top and bottom plates, shall have an outside diameter of not less than 75% of the operating height, and shall be selected to have at least 50% overload capacity before becoming coil-bound.
- 2.2.3 The bottom plate shall have bonded to it a rubber/ neoprene pad designed to attenuate any high frequency energy transmitted by the springs.

2.3 Rubber/Neoprene Type

- 2.3.1 Each mounting shall consist of a steel top plate and base plate completely embedded in oil resistant rubber/neoprene. Each mounting shall be capable of being fitted with a levelling device and should have bolt holes in the base plate and a threaded metal insert in the top plate so that they can be bolted to the floor and equipment where required.

2.4 Hangers

- 2.4.1 Hangers shall incorporate a helical steel spring or neoprene in shear element, as required, located securely in a steel cage. The clearance hold at the bottom of the cage should allow lateral movement of the lower anger rod of at least 15 degrees included angle.
- 2.4.2 If hangers incorporate a positions device, this should include a locking mechanism to prevent the hanger going out of adjustment either due to vibration or tampering.

3.0 PLANT BASES

3.1 A.V. Rails

- 3.1.1 An A.V. Rail shall comprise a steel beam with two or more height-saving brackets. The steel sections must be sufficiently rigid to prevent undue strain in the equipment and if necessary, should be checked by the Structural Engineer.

3.2 Steel Plant Bases

- 3.2.1 Steel plant bases shall comprise an all-welded steel framework of sufficient rigidity to provide adequate support for the equipment and be fitted with isolator height saving brackets. The frame depth shall be approximately $1/10^{\text{th}}$ of the longest dimension of the equipment with a minimum of 150 mm. This form of base may be used as a composite A.V. rail system.

3.3 Concrete Inertia Base (for use with steel springs)

- 3.3.1 These shall consist of an all-welded steel pouring framework with height saving brackets, and a frame depth of approximately $1/12^{\text{th}}$ of the longest dimension of the equipment, with a minimum of 100 mm. The bottom of the pouring frame should be blanked off, and concrete (2300 kg/m^3) poured in over steel reinforcing rods positioned 35 mm above the bottom. The inertia base should be sufficiently large to provide support for all parts of the equipment, including any components which over-hang the equipment base, such as suction and discharge elbows on centrifugal pumps.
- 3.3.2 A typical rule of thumb is that the ratio of mass of the base to mass of the supported equipment should be 1.5 : 1.0 for most conventional equipment, including pumps. However, this could rise to 5.0 : 1.0 for equipment with large lateral out-of-balance forces.

3.4 Concrete Split Plinth Bases

- 3.4.1 These should comprise a concrete inertia base of sufficient size to permit support for all parts of the equipment, including any components which overhang the equipment base, such as suction and discharge elbows on centrifugal pumps. The inertia base should be cast onto a permanent bottom shuttering and supported on the specified neoprene mounts or pads, the whole resting on a plinth as required. It should be noted that the construction of concrete bases on cork, expanded polystyrene or mineral wool slabs is not normally permitted. Where neoprene pads are used, small areas of pad must be equally spaced to provide the correct deflection. The supplier should advise the correct number, dimensions and locations of such pads.